THE COMMUNITY ECOLOGY OF THE PARASITES AND SYMBIONTS OF *PORTUNUS PELAGICUS*: EVIDENCE FOR POSITIVE AND NEGATIVE INTERACTIONS

Portunus pelagicus possessed a diverse community of parasites and symbionts. In 1989, over 200 crabs were dissected and examined for parasites and symbionts. The common symbiont fauna was comprised of 6 protozoans [*Operculariella* sp., *Lagenophrys* sp., *Acineta* sp. (ciliates), *Thelohania* sp., *Ameson* sp.(microsporidians), *Nematopsis* sp. (gregarine)]; 5 helminths [planocercoid turbellarian, *Levinseniella* sp. (metacercaria), *Polypocephalus moretonensis* (cestode), tetraphyllid cestode, *Carcinonemertes mitsukurii* (nemertean)]; 4 crustaceans [*Choniosphaera indicus* (copepod), *Sacculina granifera*, *Octolasmis cor*, *Chelonibia* sp. (cirripedes)], and 6–7 fouling organisms from other phyla. A few rare parasites were found (*Paranophrys* sp., *Hematodinium* sp.).

The sand crab may possessed an interactive community of parasites and symbionts. There were 11 pairs of interactions/associations between species measured by prevalence (X^2) or by log-intensity (ANOVA on presence/absence, and linear regression). Three pairs of interactions were between protozoa and metazoa. Five pairs in the log-intensity data were reciprocals, i.e. there were significant interactions between both species. There were 3 negative associations (*Carcinonemertes vs Sacculina*, *Polypocephalus* (a lecanicephalid) *vs Levinseniella* (a microphallid), and *Octolasmis cor vs Opercularielle* sp.); the remaining associations were positive. Since association may not be a result of direct species interaction, methods to substantiate the significant associations are being investigated.

The rhizocephalan barnacle, *Sacculina granifera*, had a marked effect on the assemblage of fouling species. Since sacculinised crabs do not moult, there was a notable increase in the diversity of fouling species that live in the branchial chamber and on the external surfaces of the host. The rhizocephalan also had negative effects on other symbionts. The egg predator, *Carcinonemertes mitsukurii* (Nemertea), was commonly found on the gill lamellae of post-ovigerous female crabs (Prevalence ~ 53%). In the sacculinised female host, *C. mitsukurii* was absent. Further, rootlets os *S. granifera* were observed in contact with recently dead *P. moretonensis*, and *Levinseniella* sp. The statistical analyses, however, showed no significant association between the rhizocephalan and these two helminths.

Positive associations were numerous and may have resulted from prey finding abilities (planocercoid turbellarian *vs* branchial and external symbionts), host food preferences (*P. moretonensis vs* tetraphyllid cestode), or association with other host behaviours.

Here, I show that symbionts may interact within and between different microhabitats (guilds?) of the host. The host may mediate the interaction between certain species, especially those that are pathogenic, e.g. *S. granifera vs C. mitsukurii*, because these species do not overlap in their respective host microhabitats but do overlap in their host resource use, e.g. reproductive products. Lastly, the community of parasites and symbionts in *P. pelagicus* did not fit the current definitions and models of communities and community interactions that predict few interactions between species in between guilds in 'isolationist' communities (Holmes and Price, 1986)

Literature Cited

Holmes, J.C. and Price, P.W. 1986. Communities of parasites. 187–213. In D.J. Anderson and J. Kikkawa (eds) 'Community ecology: Pattern and process'. (Blackwell Scientific Publications: Oxford).

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